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November 19, 2007

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By Hand Delivery and E-Mail

Mr. Terry Darton
Air Permit Manager
Virginia Department of Environmental Quality
13901 Crown Court
Woodbridge VA 22193

Re: Proposed Stationery Source Permit to Operate Dated October 19, 2007; Mirant Potomac River Generating Station, Alexandria, Virginia.

Dear Mr. Darton:

On behalf of the City of Alexandria, Virginia ("Alexandria"), I submit the attached EarthTech letter dated November 19, 2007 as Supplemental Comments on the above referenced State Operating Permit ("SOP"). The letter sets out EarthTech's preliminary findings on the health effects of the emissions of fine particulate matter ("$PM_{2.5}$") and the substantial monetized detriment to the community. The high health and social costs set out in the EarthTech letter reflect the unique status of the Potomac River Generating Station's location in a densely populated residential community and its significant adverse impact on a larger population than most of the other coal plants in Virginia.

Sincerely,

John B. Britton
Schnader Harrison Segal and Lewis LLP

JBB/maj
Attachment

cc: The Honorable James P. Moran
The Honorable Tim Kaine
The Honorable L. Preston Bryant, Jr.
The Honorable Richard L. Saslaw, Senate of Virginia
The Honorable Patricia S. Ticer, Senate of Virginia
The Honorable Mary Margaret Whipple, Senate of Virginia

The Honorable Bob Brink, Virginia House of Delegates
The Honorable Adam P. Ebbin, Virginia House of Delegates
The Honorable David L. Englin, Virginia House of Delegates
The Honorable Al Eisenberg, Virginia House of Delegates
The Honorable Brian J. Moran, Virginia House of Delegates
The Honorable Mayor and Members of City Council
Richard Weeks, VDEQ
Richard Langford, Chairman, VDEQ Air Pollution Control Board
Vivian Thomson, Vice-Chairman, VDEQ Air Pollution Control Board
Bruce Buckheit, VDEQ Air Pollution Control Board
John Hanson, VDEQ Air Pollution Control Board
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November 19, 2007

Mr. John Britton
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2001 Pennsylvania Avenue Suite 300
Washington, DC 20006

RE: Proposed Stationary Source Permit to Operate for the Mirant Potomac River Generating Station, Alexandria, Virginia, Dated October 19, 2007

Dear Mr. Britton:

Earth Tech has reviewed the above referenced State Operating Permit (SOP) for the Mirant Potomac River Generating Station (PRGS). Earth Tech has reviewed this SOP per your request acting on behalf of the City of Alexandria. Earth Tech has proven success in helping public- and private sector customers solve air, water and land quality, waste management and environmental planning, compliance and cleanup challenges. Steve Duda has over 25 years of experience managing and conducting human health and ecological risk assessments and National Environmental Policy Act (NEPA) studies and has provided expert witness support for a variety of environmental issues; Ms. Howard has over 15 years of experience as an Environmental Scientist evaluating chemical impacts to human health; and another contributing author, Dr. Parker, has over 30 years of extensive experience that includes a wide variety of socioeconomic as well as economic feasibility and impact studies, and technical analyses for NEPA studies.

The remainder of this letter (Section I through Section VII) provides a discussion of Earth Tech's review of the SOP.

I. Introduction

Earth Tech reviewed the proposed SOP specifically to evaluate health effects that would result from PRGS emissions of particulate matter equal to or smaller than 2.5 micrometers ($PM_{2.5}$). This review indicates that health effects are likely and that some of the operating scenarios in the SOP would produce potentially unacceptable increases in adverse health effects. These potential increases in adverse health effects are particularly troubling because the technology exists that would reduce emissions of $PM_{2.5}$ and the associated adverse health effects.

II. Health Effects Associated with $PM_{2.5}$

The effects of airborne pollutants are well documented and are the driving force behind air quality regulations. Extensive analyses have been conducted that indicate a wide range of human health and welfare effects linked to emissions of $PM_{2.5}$. Potential human health effects associated with $PM_{2.5}$ range from premature death (mortality) to illness and disease (morbidity). Health effects (e.g., respiratory and cardiovascular symptoms resulting in hospital admissions, asthma exacerbations, and acute and chronic

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bronchitis)[1] are linked to long-term (chronic) and shorter-term (acute) exposures to $PM_{2.5}$. These health effects do not begin at any particular level of exposure such as the level established by the National Ambient Air Quality Standards (NAAQS); NAAQS do not represent a zero risk level. In other words, $PM_{2.5}$ does not have a documented threshold level at which health effects begin to occur (Dockery et al. 1993, Pope et al. 1995, and Pope et al. 2002) but rather any increase in $PM_{2.5}$ could result in an increase in health effects.

III. Assessment Methodology

This potential for health effects from PRGS-related increases in $PM_{2.5}$ was evaluated for the purpose of assessing the proposed SOP. Modeled results were based on the "maximum" or "worst-case" operating scenario[2] presented in the SOP for PRGS. This scenario is one of a potential 119 different operating scenarios presented in the SOP and was selected because it represents one of the potential higher-levels of plant impacts (i.e., a "worst-case"). However, there is at least one scenario allowed within the SOP for which impacts would be higher. Impacts based on this scenario were modeled using the U.S. Environmental Protection Agency (EPA) approved AERMOD for receptors within an 800 meter grid around PRGS and for the most highly impacted receptors at the Marina Towers condominium complex. Assumptions for the AERMOD analysis conducted by Alexandria are shown in Table 1. The maximum daily average $PM_{2.5}$ generated for a 365-day period was used to evaluate potential health impacts for the population within the 800 meter grid area including the residents of the Marina Towers.

The health impacts were assessed using the EPA's Environmental Benefits Mapping and Analysis Program (BenMAP). BenMAP is a computer program that integrates a number of the modeling elements used by the EPA to evaluate the benefits of new air regulations (e.g. the Final Clean Air Interstate Rule). BenMAP integrates a number of modeling elements used in previous Regulatory Impact Analyses (e.g., interpolation functions, population projections, health impact functions, valuation functions, analysis and pooling methods) to translate modeled air concentration estimates into health effect incidence estimates and monetized benefit, or in the case of this analysis, monetized detriment. The initial health effects and costs generated from the model are presented in Table 2.

The cost of mortality from the modeled scenario would be equivalent to a direct cost of over 31 million dollars for just one year for the population within the local 800 meter grid[3]. Additional health effects (i.e., lung disease, asthma, etc.) related to the increase of $PM_{2.5}$ from PRGS would increase the annual health-related costs to nearly $34 million. These health effects and their associated direct costs are presented in

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[1] These effects are well documented through-out the literature and in reviews of the benefits of air regulations conducted by the EPA, for example the *Regulatory Impact Analysis; Control of Hazardous Air Pollutants from Mobile Sources* (EPA 2007).

[2] This scenario assumes a rate of primary PM_{10} 0.062 pounds per Million British Thermal Units (MMBtu) at an operational output level assumed to be 30% below the maximum daily impacts allowed under the proposed SOP. This scenario used '2 base' scenario C3E, i.e., 2 boilers operating at the minimum load for 24 hours per day while the draft SOP allows for a '3 base' scenario, in which 3 boilers run at a minimum load for 24 hours per day.

[3] Approximately 5000 people were estimated as living within this grid by PopGrid. The foundation for calculating the population level in the population grid-cells is the 1990 and 2000 Census block data. PopGrid is an application developed by Abt Associates that combines the Census block data with any user-specified set of population grid-cells, so long as they are defined by a GIS shape file. This application is too large to be contained within BenMAP, so the population estimates were estimated with PopGrid by a representative of Abt Associates (personal communication between E. Schreiber of Earth Tech and H. Mahoney of Abt Associates).

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Table 2. The net present worth[4] of $PM_{2.5}$ related health impacts for the modeled scenario would be 665 million dollars for the next thirty years. A complete discussion of the assumptions used for air modeling and the health effects assessment will be provided in a report to be completed by January 2008.

IV. Department of Energy Special Environmental Analysis

The U.S. Department of Energy (DOE) performed a Special Environmental Analysis (SEA) for actions taken under DOE's emergency order regarding operation of the PRGS (DOE 2006) that also addressed health effects. DOE evaluated health effects for a broader population using a grid of 36 square miles (approximately 93 kilometers). Assumptions used by DOE to conduct air modeling are shown in Table 1. DOE determined in the SEA that during the operating period from December 1, 2006 to December 1, 2007 plant emissions[5] would result in an increased incidence in mortality of 2.3 adults over 30-years old (within the 36 square mile grid). This health effect would be equivalent to a direct cost of over 17 million dollars for just one year (see cost figures presented in Table 3). DOE presented additional health effects related to the increase of $PM_{2.5}$ from PRGS for the eastern region. These health effects and their associated direct costs are presented in Table 3. The net present worth of $PM_{2.5}$ related health impacts for the next 30 years is over three billion dollars.

V. Uncertainty

The numbers listed in Table 1 derive from only one of the potential worst-case emission scenarios for PRGS; therefore maximum 24-hour impacts may be even higher than estimated. The values presented in Table 1 were estimated based on the maximum 24-hour average as the annual concentration to evaluate mortality effects, they do not include an evaluation of sensitive receptors like infants and the elderly, maximally exposed people (someone that exercises everyday outside) nor do they include an evaluation of other air pollutants like (ozone, hazardous air pollutants, silica, NO_x and SO_2) that could combine to create greater incidence of health effects or increase the severity of the health effects. The EPA has established in its Risk Assessment Guidelines for Superfund (EPA 1989) that a probability of cancer occurrence that is greater than one in one million (1 in 1,000,000) as a result of exposures to contaminants at hazardous waste sites is considered significant. The impacts for mortality estimated for exposures to modeled values of $PM_{2.5}$ by DOE would yield a risk of approximately 16 in one million[6]. Likewise, while the costs used to value health impacts may not apply to all individuals and situations they also do not take into account many secondary costs associated with illness like the loss of productivity of an individual or mental health effects of long illnesses.

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[4] Net Present Worth represents costs that are estimated in current dollars, escalated to the time when they would be spent, and then corrected to a present worth using a discount rate (3%).

[5] This scenario assumed a rate of primary PM_{10} 0.055 pounds per MMBtu at an operational output level assumed to be that allowed under the Administrative Consent Order (ACO). The ACO did not allow operation under scenarios that would have impacts as high as they would be under the '2 base' scenario C3E, i.e., 2 boilers operating at the minimum load for 24 hours per day or a '3 base' scenario, in which 3 boilers run at a minimum load for 24 hours per day.

[6] Based on the rate of mortality estimated by DOE in the SEA for a population of 30 and over within 36 square miles of PRGS.

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VI. Conclusions

The air modeling, estimation of health effects, and valuation of these effects presented in this letter have several layers of uncertainty. These comments are not meant to function as a definitive scientific assessment of the health impacts from PRGS. However, the magnitude of the health effects and the costs presented herein represent the potential risk of PRGS to the residents of Alexandria. Additionally, these risks appear to be proportionally larger for the population of Alexandria versus the region. Diligence from the regulating community should be requested to ensure that the potential health risks are appropriately managed through both engineering and management controls and that there is transparency in the regulatory permitting process that allows for accountability of the levels set in the SOP.

VII. References

Dockery DW, Pope CA, Xu X, Spengler JD, Ware JH, Fay ME, Ferris BGJ, Speizer FE. 1993. "An association between air pollution and mortality in six U.S. cities". *New England Journal of Medicine* 1993; 329: 1753-1759.

Pope CA, 3rd, Thun MJ, Nmboodiri MM, Dockery DW, Evans JS, Speizer FE, Heath CW, Jr. 1995. "Particulate air pollution as a predictor of mortality in a prospective study of U.S. adults". *American Journal of Respiratory & Critical Care Medicine* 1995; 151: 669-674.

Pope CA, Burnett RT, Thun MJ, Calle EE, Krewski D, Ito K, Thurston GD. 2002. Lung cancer, cardiopulmonary mortality, and long-term exposure to fine particulate air pollution. *Journal of the American Medical Association* (JAMA) 2002; 287: 1132-1141.

Schreiber E (Earth Tech) and Mahoney H (Abt Associates). 2007. Email communication from Mahoney to Schreiber containing the population file from PopGrid. November 16, 2007.

U.S. Department of Energy (DOE). 2006. *Special Environmental Analysis, for Actions Taken under U.S. Department of Energy Emergency Orders Regarding Operation of the Potomac River Generating Station in Alexandria, Virginia.* Washington, D.C. November 2006.

U.S. Environmental Protection Agency (EPA). 1989. Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part A). EPA/540/1-89/002 .Office of Emergency and Remedial Response. Washington, DC. December 1989.

U.S. Environmental Protection Agency (EPA). 2007. *Regulatory Impact Analysis; Control of Hazardous Air Pollutants from Mobile Sources*; Chapter 12, Cost-Benefit Analysis. Assessment and Standards Division Office of Transportation and Air Quality. EPA420-R07-002. February 2007.

Table 1
Assumptions used in the Concentration Estimates which Support Each of the US DOE SEA's and Alexandria's Estimates of Premature Mortality and Health Effects

	US DOE SEA-04 (Nov. 2006)	Alexandria's Analysis
Region Studied	App. 10 x 10 km grid	800 x 800 m receptor grid
Pollutants Used	Primary $PM_{2.5}$ with an additional sulfate component (assuming conversion of plant's SO_2 impact at a 0.07 conversion rate on 24-hour basis)[1]	Primary $PM_{2.5}$
Rates of Primary PM_{10} Assumed[3]	0.055 lb per MMBtu	0.062 lb per MMBtu
Operational Output	Maximum allowed under 'Operations under the Order' and 'Potential Extension of the Order.'	Scenario which underestimates by approximately 30% the maximum daily impacts allowed under proposed draft SOP.[4]
Time Period Used in Health Effects Calculations	Annualized, grid-averaged value.	Maximum daily estimate.
Downwash Dimensions	US EPA's BPIP-PRIME	Equivalent Building Dimensions
Approximate Maximum Daily Impact of Total $PM_{2.5}$ among all Receptors for Operations Studied[2]	***Total $PM_{2.5}$ = 72 $\mu g/m^3$*** (includes sulfate contribution and fugitive dust sources, although these have a low impact on top of Marina Towers)	***Total $PM_{2.5}$ = 65 $\mu g/m^3$*** (from Primary $PM_{2.5}$ only, no fugitive sources)

Notes:

1. Uses value for maximum PM_{10} 24-hour average in SEA's Table 4.3.1-2, equivalent to 67 $\mu g/m^3$, scaled by 0.75 (for $PM_{2.5}/PM_{10}$) and adds 7% of the 24-hour maximum SO_2 concentration allowed under the order of 314 $\mu g/m^3$
2. Overall highest impact occurs on Marina Towers.
3. US DOE applied a scaling factor of 0.75 to estimate PM2.5 primary emissions from PM10 primary emissions from the stack sources.
4. Used '2 base' scenario C3E, i.e., 2boilers operating at minimum load for 24 hours per day while draft SOP allows a '3 base' scenario, in which 3 boilers run for 24 hours per day).

DEPARTMENT OF TRANSPORTATION AND ENVIRONMENTAL SERVICES
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November 17, 2007

Mr. Terry Darton
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Re: Proposed Stationary Source Permit to Operate Dated October 19, 2007
Mirant Potomac River Generating Station, Alexandria, Virginia

Dear Mr. Darton:

The City of Alexandria ("Alexandria") appreciates the opportunity to provide comments on the above-referenced State Operating Permit ("SOP") for Mirant's Potomac River Generating Station ("PRGS") located in Alexandria, Virginia. As proposed, the SOP contains several crucial deficiencies that must be addressed prior to the issuance of a final permit. This letter discusses each of those deficiencies, and urges the State Air Pollution Control Board ("Board") and Virginia Department of Environmental Quality ("VDEQ") to resolve them in the final SOP. In addition, the letter addresses the seven questions for which the Board requested public comment.

Summary of Alexandria's Comments

1. It is imperative that impacts of $PM_{2.5}$ emissions from the PRGS be assessed and NAAQS-compliant emission limits be established in the permit.

2. Based on optimized operation of the source and the pollution control measures, and compliance with the NAAQS, the limits in the SOP must not exceed the following:

SO_2	< 0.30 lb/MMBtu	(trona optimization)
NOx	< 0.22 lb/MMBtu	(LNB/SOFA optimization)
PM	< 0.03 lb/MMBtu	(ESP performance)
PM_{10}	< 0.02 lb/MMBtu	(ESP performance)
$PM_{2.5}$	< 0.003 - 0.012 lb/MMBtu	(NAAQS compliance)
CO	< 0.20 lb/MMBtu	(BACT)
Hg	< 37 lb/yr	(actual baseline emissions)
Coal sulfur	< 0.9 wt%	(current limit for PRGS)

3. Short term (hourly and daily) emissions are arbitrary and unreasonable. They must be revised to reflect actual performance and operations at the PRGS.

4. Annual emissions must not exceed baseline emissions during the most recent 24 month period, i.e., Fall 2005 through Fall 2007. For PM_{10} and $PM_{2.5}$, the annual average baseline emissions during August 2005 through June 2007 are estimated using stack test data to be 135 and 116 tons/year, respectively.[1]

5. Baghouses must be required on all five boilers at the PRGS.

6. CEMS for CO and PM must be required on all five boilers as soon as possible. The PM_{10} and $PM_{2.5}$ fractions identified during the stack tests required by the SOP must be used in conjunction with the PM CEMS data for continuous compliance purposes.

7. Reference to trona as a PM control must be removed from the SOP.

8. All NSR issues must be promptly resolved. This includes (1) past NSR violations for LNB, SOFA and trona installations, (2) increase in the maximum heat input rates as compared to the rated capacities as listed in PRGS's current SOP, and (3) use of an alternate sorbent other than trona. The SOP must not be used to pre-authorize the use of sodium bicarbonate or another alternate sorbent without thorough evaluation and a pre-construction permit. Also, a pre-construction NSR permit must be issued for the stack merger project if Mirant wishes to pursue this project.

9. The SOP must be practically enforceable and require adequate monitoring, recordkeeping and reporting requirements as follows:

    a. Heat input rates must be enforceable. Coal firing rates and trona feed rates (tons/hr) must be recorded for each boiler.
    b. Stack tests for PM_{10} and $PM_{2.5}$ must be required every six months for the first two years. Upon demonstration of continuous compliance, the staggered schedule for boiler stack tests in Condition 37 of the proposed SOP may be followed.
    c. Emission limits that apply during all operating scenarios must be specified. Multiple operating scenarios with different limits represent intermittent controls and compliance determination under multiple scenarios is cumbersome.

[1] As of the date of this letter, data from the PRGS was only available up to June 2007 on the EPA's airmarkets website. Upon availability of plant data for the quarter ending September 2007, Alexandria recommends that full 24 months of data be used during Fall 2005 through Fall 2007. Data prior to August 2005 are not appropriate for baseline estimation because emissions during that period were shown to violate NAAQS.

d. All plant data, including monitoring and testing records, must be made available to the public in a readily-accessible manner without the need for a FOIA request.

10. Limits and compliance requirements of CAIR and CAMR, which will take effect soon after the SOP is issued, must be identified in the SOP.

The following sections provide more detailed discussions, and technical and regulatory justifications for the above comments.

I. $PM_{2.5}$ Impacts Must be Assessed

Alexandria has previously provided comments to VDEQ regarding the need to evaluate $PM_{2.5}$ emissions from the PRGS. $PM_{2.5}$ is of primary interest to the residents of Alexandria and its emissions from PRGS were initially raised as a concern in 2005. It is a regulated criteria pollutant for which the NAAQS have been established.

Alexandria's comments herein focus mainly on the direct component of this facility's $PM_{2.5}$ impacts, i.e., its primary components, as defined by US EPA to mean "*solid particles emitted from an air emissions source or activity, or gaseous emissions or liquid droplets from an air emissions source or activity which condense to form particulate matter at ambient temperatures.*" Results of air quality modeling of each of the primary and secondary components of $PM_{2.5}$ indicate that a focus on strictly the primary $PM_{2.5}$ impacts at close-in locations, for the immediate purposes of this SOP, will provide substantial assurance that this facility's total $PM_{2.5}$ impacts at close-in distances comply with Virginia's $PM_{2.5}$ standards.[2] The PRGS's impacts due to its indirect, i.e., secondary, components on regional levels of $PM_{2.5}$ also fall under the responsibility of the facility's owner/operators. However, these can be addressed within Virginia's forthcoming regional $PM_{2.5}$ attainment plans.

Regulatory Requirement

Virginia regulations at 9 VAC 5-30 include $PM_{2.5}$ within the definition of primary ambient air quality standards (AAQS). A primary AAQS defines the level of air quality which, allowing an adequate margin of safety, is necessary to protect public health. Virginia's 9 VAC 5-80-1180.A.3 prohibits the issuance of a permit unless the facility has been "*designed, built and equipped to operate without preventing or interfering with the attainment or maintenance of any ambient air quality standard (AAQS) and without causing or exacerbating a violation of any applicable ambient air quality standard.*" Furthermore, U.S. EPA has documented its support for the protection of all NAAQS when it stated that it "*will not support any continued full or partial operation of the Potomac River without verification from EPA experts that there will not be any modeled exceedances of the NAAQS caused by emissions from the plant.*" Letter from Donald S. Welsh, U.S. EPA Region III, to James P. Moran, U.S. Congress, October 21, 2005.

[2] "CALPUFF Model Runs," Sullivan Environmental Consulting, April 2007

However, as discussed below, the proposed SOP sets $PM_{2.5}$ emission limits that violate this provision of Virginia law.

$PM_{2.5}$ SIP Development

The Metropolitan Washington Air Quality Committee ("MWAQC") and VDEQ are currently in the process of developing the State Implementation Plan ("SIP") to address $PM_{2.5}$ nonattainment in the metropolitan Washington area, which includes the City of Alexandria. The SIP is due in April 2008, and is expected to be released for public comment in December 2007 or January 2008. As a part of the SIP development, VDEQ must address any "hot spots" within the nonattainment area. The PRGS is the single largest source of primary and secondary $PM_{2.5}$ emissions located within the nonattainment area of Northern Virginia. Dispersion modeling to date demonstrates that a "hot spot" exists in the area surrounding the facility and that the PRGS contributes significantly to the nonattainment in Alexandria and metropolitan Washington. Absent the resolution of this "hot spot," any SIP developed by MWAQC and VDEQ would be inadequate.

It is important to note that EPA's Clean Air Act Scientific Advisory Committee ("CASAC") recommended[3] that the annual $PM_{2.5}$ NAAQS be lowered to 13-14 $\mu g/m^3$, as compared to the current NAAQS of 15 $\mu g/m^3$. Based on this recommendation by CASAC, and the growing evidence of $PM_{2.5}$-related health effects, the MWAQC decided to continue the development of the SIP and submit it by the April 2008 due date despite recent data that shows marginal compliance with the annual NAAQS. Under the SIP, it is expected that compliance determination would be based on data from the years 2007, 2008 and 2009. Therefore, this is the most appropriate time for VDEQ to address PRGS's compliance with the $PM_{2.5}$ NAAQS and resolve the "hot spot" around PRGS.

VDEQ has previously indicated that the SIP will address the unresolved issue of $PM_{2.5}$ impacts from PRGS. However, the emission limits proposed in the SOP for PRGS appear to run counter to the goal of achieving attainment. Dispersion modeling of PRGS's primary $PM_{2.5}$ emissions conducted by Alexandria shows that PRGS will cause egregious violations of the NAAQS at the emission limits proposed in the SOP. Alexandria urges VDEQ to immediately address primary impacts of $PM_{2.5}$ in the local area within this SOP proceeding, as we describe here, yet also include an analysis of PRGS's $PM_{2.5}$ precursor emissions in the SIP and propose measures necessary to minimize these emissions to help achieve the ultimate goal of regional attainment. Local-scale NAAQS attainment, while statutorily required, can only propitiously serve the SIP for regional attainment.

VDEQ's current approach of using PM_{10} as a surrogate for addressing $PM_{2.5}$ impacts is simply inadequate given the nonattainment status of the region. There is ample guidance, as well as state-of-the-art tools, currently available (see discussions below) to address $PM_{2.5}$ emissions independently of PM_{10}. The long-term health of the citizens living in Northern Virginia should not be further compromised by the timing of the promulgation

[3] Letter dated September 29, 2006 from CASAC to EPA Administrator Stephen Johnson (EPA-CASAC-LTR-06-003)

of EPA's guidance. VDEQ must adopt a proactive, and not a reactive, approach to addressing this issue. One such approach would be for VDEQ to establish significant impact levels ("SILs") for $PM_{2.5}$ and to apply these SILs for evaluating modeled impacts in the area surrounding the PRGS, as several other states have done.

Modeling Tools are Available Now

Dispersion models described in U.S. EPA modeling guidelines are available now for modeling $PM_{2.5}$ emissions. Specifically, AERMOD is capable of modeling primary $PM_{2.5}$ emissions for local impacts, and CALPUFF can model both primary and secondary $PM_{2.5}$ emissions for impacts on regional receptors. These are the current state-of-the-art models and are well-suited for application at the PRGS. U.S. EPA has no plans to develop any new dispersion models for estimating $PM_{2.5}$ impacts. Any future modeling analysis conducted for PRGS would most likely use one or both of these models. Therefore, Alexandria does not believe there is any reason to delay $PM_{2.5}$ modeling. On the contrary, any deferral of this analysis would only delay the eventual discovery of NAAQS violations in the same manner as the much-delayed discovery of other NAAQS violations in 2005. Alexandria urges the Board and VDEQ to require $PM_{2.5}$ modeling as a part of both the issuance of this SOP as well as the SIP development.

Ambient monitoring alone is inadequate to establish NAAQS compliance for PRGS and cannot substitute for modeling. Dispersion modeling evaluates ambient impacts on a comprehensive receptor grid, while monitoring can only provide limited coverage. Therefore, all NAAQS compliance, including compliance for the limits in SOP and any future compliance determination, must be based on dispersion modeling.

Federal Guidance Supports $PM_{2.5}$ Modeling

Some states have adopted the policy described in EPA's Stephen D. Page memorandum[4] that describes a PM_{10}-as-surrogate approach for federal New Source Review ("NSR") proceedings. However, it is important to note, as the memorandum itself declares, that the "*statements in [that] policy guidance do not bind Sate and local governments and the public as a matter of law.*" Furthermore, this PM_{10}-as-surrogate approach lacks any specificity in the procedures to protect the $PM_{2.5}$ NAAQS, as is required, through an air quality compliance demonstration. Extrapolation of the Page memorandum's guidance to an air quality compliance demonstration, as VDEQ has done to date, has resulted in a proposed SOP that will allow PRGS's emissions to cause or contribution to a NAAQS violation for $PM_{2.5}$, a contravention of Virginia regulations.

Several federal rules pertaining to $PM_{2.5}$ maintenance and attainment procedures that are more recent in their issuance than the Page memorandum provide support for permitting action that protects the $PM_{2.5}$ NAAQS through an air quality compliance demonstration which is specific to $PM_{2.5}$. First, the Clean Air Fine Particle Implementation Rule, which became final on April 25, 2007, states that upon "*promulgation of this final rule, the EPA*

[4] "Implementation of New Source Review Requirements in PM-2.5 Nonattainment Areas," Stephen D. Page, April 5, 2005 (available at http://www.epa.gov/oar/nsr/documents/nsrmemo.pdf)

will no longer accept the use of PM_{10} emissions information as a surrogate for $PM_{2.5}$ emissions information given that ***both pollutants are regulated by a National Ambient Air Quality Standard and are therefore considered regulated air pollutants"*** (emphasis added). Additionally, EPA's proposed rule for Prevention of Significant Deterioration for $PM_{2.5}$[5] proposes three different levels of significant impact levels, i.e., thresholds designed specifically to address the $PM_{2.5}$ NAAQS, to which a $PM_{2.5}$ source's impacts can be limited in order to demonstrate that its impacts will not cause or contribute to a violation of the $PM_{2.5}$ standards.

The table below shows several federal guidance documents which imply or explicitly describe the acceptability of application of a Gaussian dispersion model such as AERMOD to estimate a facility's local-scale impacts of primary $PM_{2.5}$.

EPA Guidance Documents Acknowledging the Acceptability of a Gaussian Model for Determining Primary $PM_{2.5}$ Impacts from Sources

Document	Guidance
Prevention of Significant Deterioration (PSD) for Particulate Matter Less than 2.5 Micrometers ($PM_{2.5}$)—Increments, Significant Impact Levels (SILs) and Significant Monitoring Concentration (SMC); Proposed Rule (1)	"*We have also provided approved air quality models and guidelines for sources to use to project the air quality impact of each pollutant (over each averaging period)...*" US EPA's Guideline on Air Quality Models is referenced, which includes AERMOD as a recommended model.
Appendix B - Local-Scale Assessment of Primary $PM_{2.5}$ for Three Urban Areas(2)	AERMOD is applied in "*[l]ocal-scale air quality modeling ...to examine the spatial variability of direct $PM_{2.5}$ concentrations associated with emissions of primary $PM_{2.5}$...*"
Guidance on the Use of Models and Other Analyses for Demonstrating Attainment of Air Quality Goals for Ozone, $PM_{2.5}$, and Regional Haze(3)	"*...while dispersion models may not be an appropriate tool for determining secondary $PM_{2.5}$ concentrations, they work well for use in determining local primary $PM_{2.5}$ impacts in a small area.*"

(1) Federal Register (72 FR 54111): http://www.epa.gov/fedrgstr/EPA-AIR/2007/September/Day-21/a18346.pdf
(2) EPA's Support Center for Regulatory Atmospheric Modeling: http://www.epa.gov/scram001/modelingapps_disp.htm
(3) EPA's Support Center for Regulatory Atmospheric Modeling: http://www.epa.gov/scram001/guidance_sip.htm

Modeling Requirements of Other States

Several states have adopted policies for $PM_{2.5}$ permitting that agree with Alexandria's approach. In several of these states, permit applications have been processed under these policies, and permits stipulating $PM_{2.5}$ emission limitations have been issued. Correspondence with these states is summarized in the table below.

[5] Federal Register, September 21, 2007, 40 CFR Parts 51 and 52, Prevention of Significant Deterioration (PSD) for Particulate Matter Less than 2.5 Micrometers ($PM_{2.5}$) – Increments, Significant Impact Levels (SILs) and Significant Monitoring Concentration (SMC); Proposed Rule.

Guidance from States Requiring $PM_{2.5}$ Modeling

State	Elements of $PM_{2.5}$ Permitting Procedures	Comments
Connecticut[1]	• SILs of 0.3 $\mu g/m^3$ (annual) and 2.0 $\mu g/m^3$ (24-hr) • Background based on 3-yr averages of annual and 98th percentile 24-hour values from existing $PM_{2.5}$ network • Modeled 3-yr average of maximum 8th highest 24-hr and annual values added to background and compared to $PM_{2.5}$ NAAQS	"AREMOD [sic] has been run and used to demonstrate compliance with the new interim $PM_{2.5}$ policy in a couple of cases so far." Permits, if issued yet, would "contain a $PM_{2.5}$ specific emission limitation."
New Jersey[2]	• SILs of 0.3 $\mu g/m^3$ (annual) and 2.0 $\mu g/m^3$ (24-hr) • Only direct $PM_{2.5}$ emissions addressed • Must reduce impacts below the SIL if violation of $PM_{2.5}$ NAAQS is predicted	Several permit proceedings have abided by written policy to date, and agency has stipulated $PM_{2.5}$ limits within several permits.
New York[3]	• SILs of 0.3 $\mu g/m^3$ (annual) and 5.0 $\mu g/m^3$ (24-hr) • Requires applicant to demonstrate compliance for both primary and secondary components • Air quality analysis must provide expected contribution to annual and 24-hour ambient concentrations	Policy has been implemented.
Michigan[4] **Pennsylvania** [5]	• SILs of 5.0 $\mu g/m^3$ (24-hr)	Sources obtaining permits are complying with $PM_{2.5}$ standard by demonstrating that their impacts are below the specified SIL for $PM_{2.5}$

(1) Correspondence with J. Catalano, CT DEP, Nov. 7, 2007
(2) Correspondence with Gregory John, NJ DEP, Nov. 5, 2007
(3) Correspondence with Bob Gaza, NYSDEC, Nov. 1, 2007
(4) Correspondence with James Haywood, Senior Meteorologist, relayed by Lori Myott, Senior Engineer, MI DEQ, Nov. 9 and Nov. 15, 2007
(5) Correspondence with Mr. Yunger, PA DEP, Jul. 18, 2007

Proposed $PM_{2.5}$ Limits are Not NAAQS-Protective

Alexandria has applied AERMOD to calculate $PM_{2.5}$ impacts from this facility in the same manner as applied for PRGS's other criteria pollutants, i.e., PM_{10}, CO, NOx and SO_2. Even assuming stack emissions that are equivalent to a level that can be achieved by this facility's ESPs, i.e., emissions lower than the limits in the proposed SOP, results show that this facility's maximum potential impacts contribute to severe exceedances of Virginia's $PM_{2.5}$ standard. At the $PM_{2.5}$ emission levels allowed by the proposed SOP, the ambient impacts are far greater.

Despite VDEQ's commitment to address this pollutant and despite the availability of the models necessary to estimate $PM_{2.5}$ impacts in the ambient air, no such analysis has been conducted to date. At the least, Alexandria requests that primary $PM_{2.5}$ emissions should be quantified and modeled, and appropriate emission limits should be established in the SOP. Alexandria's modeling results demonstrate egregious violations of the $PM_{2.5}$ NAAQS for the proposed operations. The following table shows the modeled 24-hour average impact due to primary stack emissions alone for one of the operating scenarios in the proposed SOP.

Modeled Primary $PM_{2.5}$ Impacts from PRGS for Boilers Alone (Five-Stack Configuration)

Modeled Scenario	Averaging Period	Modeled $PM_{2.5}$ Rate (lb/MMBtu)	Modeled Impacts on Marina Towers ($\mu g/m^3$)	Monitored Background[3] ($\mu g/m^3$)	Total Impact ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)
3 Base Boilers 3, 4 & 5 at min load, 24 hrs/day	24-hr	0.035	21.7 [1]	34.1	**55.8**	35
2 Base Boilers 4 & 5 at min load, 24 hrs/day	24-hr	0.055	22.1 [2]	34.1	**56.2**	35
2 Base Boilers 4 & 5 at min load, 24 hrs/day	Annual	0.055	3.5 [2]	14.2	**17.7**	15

(1) For one year modeling (2001) of primary stack emissions, assuming $PM_{2.5}$ emissions equal 64% of PM emissions at 0.055 lb/MMBtu. The 64% ratio is based on the December 2006 stack test data. The listed impact is the highest of the eighth-highest (98th percentile) modeled value from AERMOD modeling using Mirant's modeling files posted on VDEQ's ftp site with no change, except to allow calculation of the 8th highest impacts.

(2) For five years of modeling (2001, 2003-2006) of primary stack emissions, assuming $PM_{2.5}$ emissions are equal to the rate allowed by the SOP, i.e., 0.055 lb/MMBtu. The listed 24-hour impact is the highest of the 3-year averages of eighth-highest (98th percentile) modeled values, and the annual impact is the highest 3-consecutive-year average, from AERMOD modeling using Mirant's modeling files posted on VDEQ's ftp site with no change, except to allow calculation of the 8th highest impacts.

(3) The 24-hr value is the 3-year average of the 8th highest daily observations, and the annual value is the 3-year average, for years 2004 – 2006 from VDEQ's Aurora Hills monitor. Data provided by Mr. Michael Kiss of VDEQ.

Even without the inclusion of (1) the fugitive $PM_{2.5}$ emissions from the PRGS's coal and ash handling operations, (2) the effect of secondary $PM_{2.5}$ formation due to precursor emissions from PRGS, and (3) $PM_{2.5}$ emissions from other nearby interacting sources, the predicted impacts far exceed the NAAQS. The above table also may not reflect the worst-case impacts from all operating scenarios listed in the proposed SOP. Furthermore, the table shows that if the $PM_{2.5}$ emissions of 0.055 lb/MMBtu are allowed, as proposed in the SOP, the modeled impacts are even greater. These high impacts require scrutiny by the Board and an analysis of pollution control and impact mitigation measures. Given the high impacts, primary $PM_{2.5}$ emissions from each boiler must be reduced to a level much lower than 0.01 lb/MMBtu in order to demonstrate NAAQS compliance.

The table below shows the calculated $PM_{2.5}$ emission rates at which the PRGS's boilers will not cause or contribute to an exceedance of the NAAQS, i.e., the impacts at these emission rates will be below the $PM_{2.5}$ significant impact levels proposed by U.S. EPA (September 21, 2007). AERMOD results for $PM_{2.5}$ indicate that compliance with the 24-hour NAAQS will substantially assure compliance with the annual NAAQS.

Calculated $PM_{2.5}$ Emission Limits Necessary for NAAQS Compliance

Averaging Period	Proposed SOP Limit (lb/MMBtu)	Modeled $PM_{2.5}$ Impact at Proposed SOP Limit[1] ($\mu g/m^3$)	U.S. EPA's Proposed $PM_{2.5}$ SILs ($\mu g/m^3$)	Calculated $PM_{2.5}$ Limit for Impacts to be Below SIL (lb/MMBtu)
24-hr	0.055	22.1	5.0	0.012
			4.0	0.010
			1.2	0.003
Annual	0.055	3.5	1.0	0.016
			0.8	0.013
			0.3	0.005

(1) Results for "**2 Base**" case, i.e., assuming Boilers 4 and 5 running at minimum load for 24 hours per day. Other scenarios must be evaluated to identify the worst-case impacts.

Alexandria believes that installation of baghouses, possibly combined with some operational restrictions at PRGS, will reduce $PM_{2.5}$ emissions to a level necessary for NAAQS compliance. In the absence of baghouses, substantial curtailment of operations is required. Therefore, it is evident that Conditions 23 through 28 of the proposed SOP must be modified to reflect the required $PM_{2.5}$ emission limitations for all boilers.

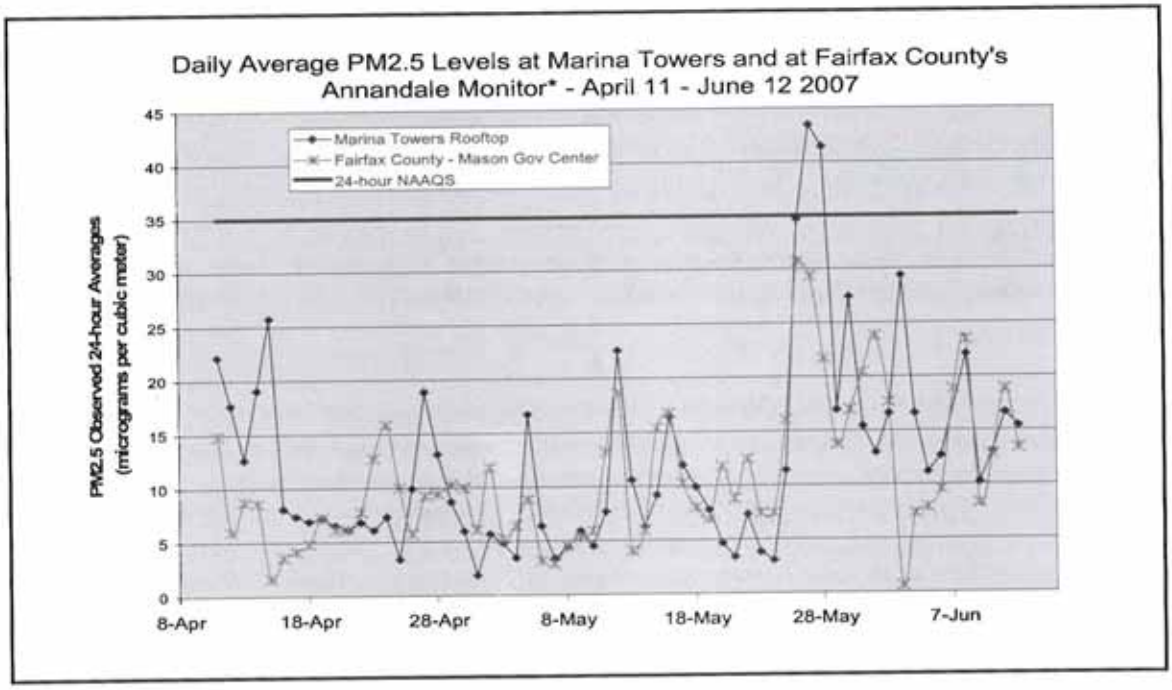
Impacts of Fugitive Emissions

Alexandria's analysis of AERMOD results for fugitive sources also indicate that maximum impacts from the coal and ash yard sources would contribute a substantial $PM_{2.5}$ impact at low-level receptors, even without consideration of impacts from diesel engines' emissions of truck traffic from ash hauling, which are also PRGS's responsibility to control and mitigate if necessary. The impacts from the fugitive sources should be fully evaluated within the $PM_{2.5}$ impacts assessment, just as the facility's PM_{10} analysis has done to date. Potential mitigation measures for coal and ash yard sources include (1) full enclosure maintained under negative pressure for the ash unloading operations, or as an alternate, a fully enclosed pneumatic system for ash handling, (2) reducing the footprint of the coal pile to that modeled by Mirant and limiting the height of the coal pile to no more than the height of the screen fence, and (3) particulate matter traps on mobile source exhausts, when these are included. The emission problems with the ash unloading operations have been evident on a routine basis at the PRGS, including during a recent VDEQ inspection on October 4, 2007 in which the inspectors "*observed a large plume of fugitive dust emissions escaping from the ash unloading area.*"

Fugitive emissions from ash handling operations have increased since the trona injection system was installed at the PRGS. At 0.9% sulfur in coal and trona use rate at a stoichiometric ratio of 2.0, Alexandria estimates that an additional 11 lb/MMBtu of ash is produced from trona alone compared to about 8 lb/MMBtu of ash from the coal. Consequently, the amount of ash produced by PRGS has more than doubled due to trona use. The watering system currently in use during ash unloading is simply inadequate to control the amount of fugitive dust generated. An enclosure with negative pressure or pneumatic handling of ash is necessary for this operation.

Alexandria's Monitoring Results

Alexandria has also collected several months of ambient $PM_{2.5}$ data at the roof of Marina Towers during 2007. The following chart is a summary of the monitored concentrations, along with simultaneous data from regional monitors. In addition, the table below shows more detailed monitoring data during three days in May 2007 when concentrations at Marina Towers approached or exceeded NAAQS. The data shows that concentrations at Marina Towers often exceed the regional values and in some cases exceed the NAAQS level. These data further enforce the need to evaluate and mitigate $PM_{2.5}$ impacts from the PRGS.



Monitor Location		Daily Average PM2.5 Levels ($\mu g/m^3$) (NAAQS = 35 $\mu g/m^3$)		
		May 26, 2007	May 27, 2007	May 28, 2007
Arlington Co. FRM1	S. 18th and Hayes St.	--	29.5	--
Arlington Co. FRM2	S. 18th and Hayes St.	--	29.8	
Franconia	Lee Park, Telegraph Rd	29.9	25.0	16.0
Annandale (Fairfax Co.)	6507 Columbia Pike	--	29.5	--
Annandale (Fairfax Co.)	6507 Columbia Pike	30.7	29.3	21.7
McLean	1437 Balls Hill Road	--	25.9	
Ashburn	38-1 Broad Run HS	--	24	--
Marina Towers	Rooftop	34.7	43.4	41.4

Baghouses are Required to Adequately Control PM Emissions

The overwhelming evidence of PRGS's high impacts and the preponderance of data linking $PM_{2.5}$ to serious health effects, up to and including premature deaths, require the

Board and VDEQ to take a proactive stance towards minimizing emissions from this facility and mitigating the adverse impacts. Beyond the available regulatory framework, the Board also has the general duty to protect public health and is authorized to use discretion in the interest of protecting public health and the environment. In a permitting action such as the issuance of this SOP, Virginia law at Title 10.2, § 1307.E, authorizes the Board to consider the threat caused by any activity due to the "*character and degree of injury to, or interference with, safety, health, or the reasonable use of property*" and the "*scientific and economic practicality of reducing or eliminating the discharge resulting from such activity*" and balance it with the "*social and economic value of the activity.*" Alexandria urges the Board to use its discretionary authority to critically evaluate these health effects and mandate the reduction of particulate matter emissions from PRGS. The harm cause by PRGS is significant, and exacerbated by the intense residential development around the plant, while the value of the plant's service is diminished from that period when Washington D.C. relied on its output to meet energy reliability needs. Given that it is feasible and practical to control and monitor $PM_{2.5}$ emissions from the PRGS, Alexandria requests that the Board should exercise a broad scope of review in this permitting action.

Analysis conducted by Alexandria to date shows that baghouses are necessary on all five boilers in order to mitigate the adverse health-related impacts from PRGS. Alexandria believes that this is the only way for the PRGS to reduce its particulate matter emissions sufficiently to comply with NAAQS and alleviate the health impacts. Alexandria also believes that baghouses would have likely been required if PRGS had properly applied the major NSR regulations and secured a construction permit prior to the installation of the trona injection system. Alexandria requests the Board to earnestly consider the benefits of baghouse installation at PRGS. Not only will baghouses reduce particulate matter emissions, they will enhance the performance of trona in reducing SO_2 and acid gas emissions, and will also aid in the reduction of mercury emissions. Baghouses will also help shave the peak 5-minute SO_2 concentrations at nearby receptors, which is a concern that led the Agency for Toxic Substances and Disease Registry ("ATSDR") to conduct a ambient monitoring study in the area surrounding the PRGS. The benefits of this multi-pollutant control far exceed the cost of the baghouses.

II. Pollution Control Measures Must be Optimized

Regardless of the level of operations at the PRGS, the use of pollution control measures should be optimized to achieve sustainable maximum pollutant reductions. Virginia regulations require that "*[a]t all times, including periods of startup, shutdown, soot blowing and malfunction, owners shall, to the extent practicable, maintain and operate any affected facility including associated air pollution control equipment in a manner consistent with air pollution control practices for minimizing emissions.*"
9 VAC 5-40-20.E. Although Condition 42 of the proposed SOP contains this regulatory language, the emission limits in the SOP fail to reflect this requirement.

SO_2 Control

Given the above regulatory requirement, no emission limits can be established that allow less than the optimum use of the trona control system. Therefore, even under scenarios where the plant can emit at greater levels without causing NAAQS violation, e.g., when it operates only one or two boilers, Mirant must use trona to minimize emissions to the extent practicable. The emission limits established in the permit must reflect this optimum use of the trona system. The lb/MMBtu limit for any operating scenario allowed in the permit must reflect an upper limit that must be achieved by each boiler at all times of operation. This upper limit must be based on the capability of the trona system to maximize SO_2 reductions. Recent data from PRGS during trona use in 2006 and 2007 (see table below) shows that SO_2 emissions ranging from 0.15 to 0.25 lb/MMBtu are sustainable for extended periods. In addition, more recent data from the facility for operation under the current SOP issued on June 1, 2007 shows that the plant can consistently meet a limit of 0.30 lb/MMBtu. Therefore, the SOP should not permit SO_2 emissions in excess of 0.30 lb/MMBtu for any operating scenario. Conditions 23 through 28 of the proposed SOP must be revised to reflect this limit, unless a lower limit is necessary for NAAQS compliance.

Additionally, given this plant's setting and proximity to residences, Condition 21 should be modified to only allow the combustion of ultra-low sulfur diesel oil in the boilers as an auxiliary fuel, i.e., oil with no greater than 0.05% sulfur. This limitation also serves to reduce particulate emissions from the boilers during oil combustion, e.g., during startup and idling conditions.

Reported SO_2 Emissions with Trona Use at Mirant PRGS

Month		Reported SO_2 Rate (lb/MMBtu) with Trona				
		Boiler 1	Boiler 2	Boiler 3	Boiler 4	Boiler 5
Feb 2006	Average	0.28	0.15	0.22	0.20	--
Mar 2006	Average	--	0.19	0.19	0.22	0.23
Apr 2006	Average	--	--	0.22	0.22	0.23
May 2006	Average	0.35	0.22	0.23	0.25	0.31
Jun 2006(1)	Average	0.22	0.35	0.44	0.42	0.34
Jul 2006(1)	Average	0.47	0.46	0.47	0.48	0.50
Aug 2006(1)	Average	0.47	0.48	0.48	0.48	0.51
Sep 2006(1)	Average	0.39	0.50	0.51	0.52	0.52
Oct 2006(1)	Average	0.40	0.44	0.45	0.48	0.49
Nov 2006(1)	Average	0.47	0.47	0.48	0.49	0.50
Dec 2006(1)	Average	0.54	0.46	0.49	0.52	0.67
Jan 2007(1)	Average	0.50	0.50	0.47	0.50	0.49
Feb 2007(1)	Average	0.53	0.48	0.49	0.48	0.50
Mar 2007(1)	Average	0.56	0.46	0.49	0.48	0.54
Month		**Reported 3-Hour SO_2 Rates (lb/MMBtu) with Trona**				
		Boiler 1	Boiler 2	Boiler 3	Boiler 4	Boiler 5
Jul 2007(2)	Minimum	0.16	0.04	--	--	0.16
Jul 2007(2)	Average	0.31	0.32	--	--	0.34
Jul 2007(2)	Maximum	0.45	0.52	--	--	0.53
Month		**Reported 24-Hour SO_2 Rates (lb/MMBtu) with Trona**				
		Boiler 1	Boiler 2	Boiler 3	Boiler 4	Boiler 5
Jul 2007(2)	Minimum	0.28	0.30	--	--	0.30
Jul 2007(2)	Average	0.31	0.33	--	--	0.34
Jul 2007(2)	Maximum	0.36	0.47	--	--	0.48

(1) Operation under the EPA's ACO issued in June 2006 that allowed SO_2 emissions to vary based on a prohibited dispersion technique, i.e., daily predictive modeling and forecasted meteorological data.

(2) Operation under the State Operating Permit issued by VDEQ on Jun 1, 2007.

Alexandria remains concerned regarding the potential health effects of trona. Based on a recent inconclusive review, Virginia Department of Health recommended that further studies be conducted. Alexandria requests that trona's health effects be assessed in a comprehensive manner as indicated by VDEQ in its July 26, 2006 letter to Alexandria.

Particulate Matter Control

The proposed SOP specifies a particulate matter emission limit of 0.055 lb/MMBtu for all boilers. The same limit is specified for PM, PM_{10} and $PM_{2.5}$ and the corresponding lb/hour and lb/day limits are based on this lb/MMBtu limit. This limit is a factor of two to five times greater than the facility's stack test results of December 2006 and therefore does not reflect the optimum use of the facility's Electrostatic Precipitators (ESPs). The following are the results from the December 2006 stack tests when trona was in use.

PM: 0.018 – 0.029 lb/MMBtu
PM_{10}: 0.014 – 0.016 lb/MMBtu
$PM_{2.5}$: 0.012 – 0.013 lb/MMBtu

Given the above results, an emission limit of 0.055 lb/MMBtu for PM, PM_{10} and $PM_{2.5}$ would be arbitrary, provide an unusually high compliance margin, and may ultimately allow PRGS to increase emissions without appropriate regulatory review. Alexandria understands that the December 2006 stack test is not indicative of continuous ESP performance. However, a compliance margin of two to five times the actual performance is unreasonable. Instead, the PRGS must be required to optimize the ESP performance to minimize emissions at all times and the PM emission limits must reflect such performance. Furthermore, the December 2006 stack test showed that PM_{10} and $PM_{2.5}$ emissions are a fraction of the total PM emissions, i.e., 75% and 64%, respectively, based on Boiler 3 tests, and 56% and 46%, respectively, based on Boiler 2 tests. Therefore, the emission limits for PM_{10} and $PM_{2.5}$ must be lower than for total PM, must reflect actual ESP performance, and must be NAAQS compliant.

Condition 11 of the proposed SOP requires a demonstration of ESP control efficiency necessary to meet the PM emission limits. Without adequate PM emission limits, Condition 11 is ineffective and meaningless because PRGS can achieve the prescribed emission limits at low ESP control efficiencies.

Alexandria requests the Board and VDEQ to revise Conditions 23 through 28 and Condition 30 of the proposed SOP and specify pollutant-specific (PM, PM_{10}, $PM_{2.5}$) emission limits that reflect actual ESP performance for each pollutant, and recalculate the corresponding lb/hour, lb/day and tons/year limits accordingly.

NOx Control

The proposed SOP specifies a NOx emission limit of 0.32 lb/MMBtu for all boilers and the corresponding lb/hour limits are based on this lb/MMBtu limit. While all five boilers at PRGS employ low-NOx burners (LNB), the three base load units (Boilers 3, 4 and 5)

also employ separated overfire air (SOFA) technology for additional NOx reduction. It is therefore unreasonable to specify an emission limit for Boilers 3, 4 and 5 that is the same as Boilers 1 and 2. The additional NOx reduction provided by SOFA, i.e., approximately 30 to 40%,[6] must be reflected in the emission limits. The PRGS must be required to optimize both the LNB and the SOFA technologies to minimize NOx emissions, and the emission limits must reflect their performance. Alexandria requests the Board and VDEQ to revise Conditions 25 through 28 of the proposed SOP to reflect a NOx limit of no more than about 0.22 lb/MMBtu from Boilers 3, 4 and 5, i.e., a limit still higher than what has been demonstrated for other pulverized coal-fired boilers retrofitted with LNB and SOFA technologies, such as the Texas Municipal Power Agency's Gibbons Creek plant.

III. Emission Limits are Arbitrary and Unreasonable

The proposed SOP specifies short term emission limits that are inconsistent with the annual limits. Furthermore, the emission limits are based on operational configurations that are unrealistic and without regard to the manner in which the PRGS actually operates. The emission limits in the SOP appear to be strictly based on levels that would demonstrate compliance with the NAAQS. While NAAQS compliance is essential for PRGS, sole reliance on such compliance is unreasonable in that it disregards the actual emissions achieved by the facility. In fact, several of the short term emission limits in the SOP are set so high that they are meaningless because PRGS does not emit at these levels and cannot achieve operational levels inherent in these limits. The following are examples of the arbitrary and unreasonable nature of the limits.

- The lb/hour and lb/day limits for every pollutant, except SO_2, appear to be based on maximum load operation of Boilers 1, 4 and 5 (total 3,247 MMBtu/hr) for 24 hours per day. Similarly, for SO_2, each operational configuration allows 24 hours per day operation at full load for the number of boilers allowed in that configuration. This is unrealistic because PRGS does not operate its boilers at full load for the entire day. This is especially true for the cycling units, i.e., Boilers 1 and 2. The boilers at PRGS routinely reduce load during night time due to lower electric demand.

- The lb/MMBtu limits do not reflect optimized use of the pollution control measures to minimize emissions. As discussed elsewhere in this letter, the actual emissions at PRGS are considerably smaller than the limits in the SOP.

- The short term limits are set so high that the PRGS will quickly exceed its annual limits if it were allowed to emit at the hourly and daily limits specified in the SOP. For example, the CO limit of 2,997.20 lb/hour allows only six (6) days of

[6] Mirant has claimed a 15% NOx reduction due to LNB on Boilers 3, 4 and 5, and 5 to 10% reduction due to LNB on Boilers 1 and 2 (presentation to MWAQC, 1/21/05, available at http://www.mwcog.org/uploads/committee-documents/olxeXFk20050121073747.pdf). EPA's Fact Sheet on the NOx Consent Decree claims 40 to 50% NOx reduction from the combination of LNB and SOFA technologies (available at http://www.epa.gov/oeca/erth/resources/cases/civil/caa/mirantfs.pdf).

operation before the annual limit is exceeded. Similarly, the $PM_{2.5}$ and PM_{10} limit of 178.59 lb/hour allows only 76 and 175 days of operation, respectively, and the hourly limits for HCl and HF only allow 122 days of operation before exceeding the annual limits. The short term limits are therefore meaningless because Mirant cannot realistically emit at those levels without jeopardizing year-round operation.

- The tons/year limits for PM, PM_{10} and $PM_{2.5}$ are much higher than PRGS's current emissions. The proposed SOP appears to allow PRGS to increase emissions without review by the Board and VDEQ.

Alexandria requests the Board and VDEQ to reduce the hourly and daily limits in Conditions 23 through 28 to reflect actual emissions and operations at the PRGS, with a reasonable margin of compliance. Similarly, the annual limits for particulate matter in Condition 30 of the SOP must be reduced to reflect actual performance of the facility.

IV. CEMS for CO and PM Must be Required As Soon As Possible

PM CEMS

Condition 14 of the proposed SOP specifies the requirement to install PM Continuous Emissions Monitoring System ("CEMS"). However, the installation of PM CEMS is deferred until performance specifications and operations requirements are promulgated by EPA and VDEQ has notified PRGS in writing of a deadline to install them. VDEQ seems to have ignored the fact that EPA promulgated the Performance Specification 11 ("PS-11") applicable to PM CEMS on January 12, 2004 (40 CFR 60, Appendix B) and finalized the Procedure 2 (40 CFR 60, Appendix F) for ongoing performance evaluations. EPA's PS-11 specifies the requirements for evaluating the acceptability of PM CEMS at the time of installation and requires site-specific correlation of the PM CEMS response against manual gravimetric Reference Method measurements. PS-11 also outlines the procedures and acceptance criteria for installation, operation, calculations, and reporting of data generated during a PM CEMS correlation. Several applications of PM CEMS have been certified using PS-11 criteria. Similarly, the Procedure 2 specifies ongoing operations requirements for the PM CEMS using a combination of daily calibration and quarterly audits. The daily calibration includes zero and upscale drift checks, as well as sample volume checks. Quarterly audits, required to be performed no less than two months apart, include Absolute Correlation Audits (ACA) and Sample Volume Audits (SVA). In lieu of an ACA, the facility may perform a Response Correlation Audit (RCA) or a Relative Response Audit (RRA). These installation and operational procedures are currently in place and have been in use for several years.

The following table presents a partial list of facilities that have installed and are currently operating PM CEMS for compliance purposes.

Partial List of Sources Currently Using PM CEMS

Source	PM CEMS Installation Date	PM CEMS Technology
Tampa Electric – Big Bend Unit 4	Feb 2002	Beta Attenuation
Dominion Generation – Mt. Storm Units 1 & 2	Jul 2004	Beta Attenuation
We Energies - Oak Creek Units 5 & 6	Jan 2005	Beta Attenuation
We Energies - Pleasant Prairie Units 1 & 2	Sep 2006	Beta Attenuation
Western Kentucky Energy - Henderson Unit 2	Aug 2005	Beta Attenuation
Western Kentucky Energy - Henderson Unit 1	Feb 2007	Beta Attenuation
Kentucky Utilities Company - Ghent Station		Light Scatter
Kentucky Utilities Company - Mill Creek Station		Light Scatter
Minnkota Power Coop – M.R. Young Unit 2	Jul 2007	Beta Attenuation
DOE Oak Ridge TSCA Incinerator	Dec 2004	Beta Attenuation
Rayonier Pulp Mill - Recovery Boiler	Apr 2003	Beta Attenuation
Kennecott Utah Copper – Primary Smelter	Dec 2005	Beta Attenuation
Sunoco Refinery – FCCU/CO Boiler Stack	Apr 2007	Beta Attenuation

As early as September 2000, EPA identified several manufacturers of PM CEMS in a report titled "Current Knowledge of Particulate Matter (PM) Continuous Emission Monitoring" (EPA-454/R-00-039) utilizing different technologies such as beta attenuation, light scattering, scintillation and electrostatic induction. Based on recent applications, Alexandria believes that beta attenuation and light scattering are the most developed methodologies. EPA identified the following manufacturers in its September 2000 report for these two methodologies.

Beta Attenuation
- Durag
- Mechanical Systems, Inc.
- Environment S.A.

Light Scatter
- Sigrist
- Durag
- Environmental Systems Corporation
- Sick Maihak Inc.
- Grimm Technologies
- Monitor Labs

PM CEMS provide the most reliable data for compliance purposes on a continuous basis. Without PM CEMS, the only available data would be from periodic stack tests, which are not reliable for establishing continuous compliance. Based on the current experience with certified PM CEMS and given the availability of EPA's performance specification and quality assurance procedures, there is no reason to defer the installation of PM CEMS at PRGS. Alexandria requests the Board and VDEQ to require the installation of PM CEMS as soon as possible, but no later than six months from the SOP issuance date.

CO CEMS

Condition 15 of the proposed SOP requires the installation of CEMS for monitoring CO emissions. However, the SOP allows PRGS up to twelve months for the installation.

The PRGS currently operates CO CEMS at the facility. Alexandria fails to see the rationale for allowing twelve months to meet this requirement. The CO CEMS at the facility must be calibrated and the performance evaluations must be conducted as soon as possible. Alexandria requests the Board and VDEQ to require the PRGS's CO CEMS to be used for compliance purposes immediately upon calibration, but no later than three months from the SOP issuance date.

V. Trona is Not a Particulate Matter Control

Condition 5 of the proposed SOP stipulates that Mirant shall use dry sorbent injection (trona or equivalent) as a means to control particulate matter (PM) emissions from the facility's boilers. Dry sorbent use is not a PM control measure for the boilers. On the contrary, dry sorbent use involves the injection of additional PM, thereby increasing the PM loading in the exhaust duct. Mirant uses as much as four (4) tons per hour of trona for each boiler to achieve the required level of sulfur dioxide control. This has a great potential for increasing the PM emissions from the boilers, including PM_{10} and $PM_{2.5}$.

Alexandria has analyzed several months of opacity data from all five boilers at the PRGS. The data reflect actual in-stack Continuous Opacity Monitoring System (COMS) readings during operations both with and without the use of trona. The following table shows that in-stack opacity increased for every boiler due to the use of trona by as much as 110 percent. Given that opacity is an indicator of particulate matter emissions, especially fine particulate matter, Alexandria believes that trona contributes to PM emissions increases. The use of trona should not be listed in the SOP as a PM emissions control.

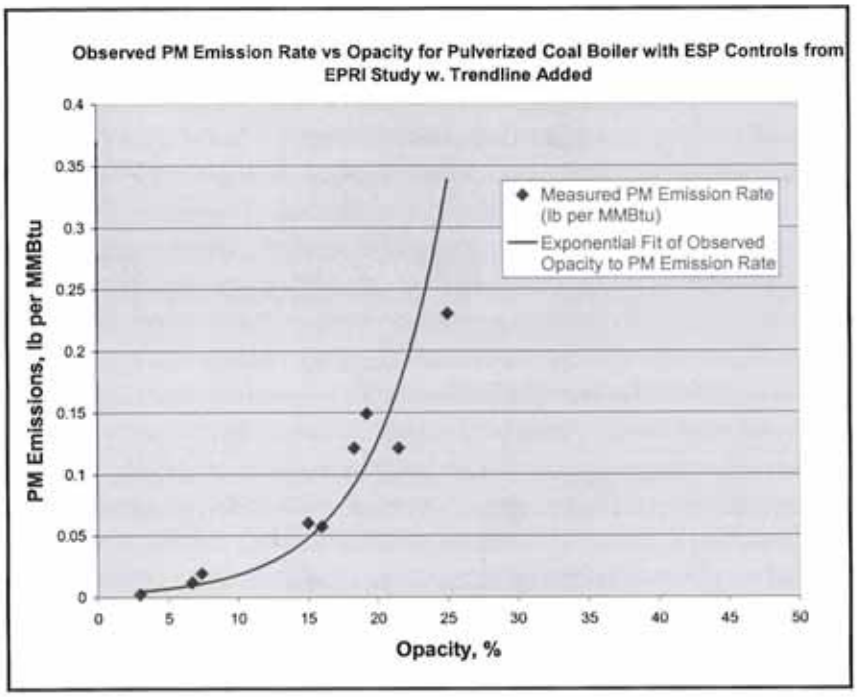
Average Stack Opacity With and Without Trona Use

Boiler	Average Opacity(1)		% Increase in Opacity
	Pre-Trona (Jun-Aug 2005)	Post-Trona (Jun-Aug 2006)	
1	2.86	6.03	110.8%
2	4.16	6.76	62.5%
3	3.62	3.74	3.3%
4	2.61	3.10	18.7%
5	2.55	4.10	60.8%

(1) Based on a summary of 20,000 data points reported by Mirant for stack opacity, which is a surrogate for particulate matter emissions.

The figure below shows a curve fit between observed emission rates and opacity for testing of a pulverized coal boiler, obtained by Electric Power Research Interest Group, and reported by U.S. EPA.[7] These data clearly show that opacity positively correlates with PM emissions. Of particular concern to Alexandria is the fact that opacity is closely related to fine particulate matter in the size range of about 1 μm. Therefore, any increase in opacity is very likely related to increases in $PM_{2.5}$ emissions.

[7] "Current Knowledge of Particulate Matter (PM) Continuous Emission Monitoring," US EPA-454/R-00-039, September, 2000



In response to Alexandria's recent request for data and analyses relating opacity increases to either increases or decreases in PM emissions, VDEQ wrote that it has "*determined that the information that you have requested cannot be found or does not exist in the records of the Department of Environmental Quality*" and that the VDEQ is "*not aware of another source of the information you requested.*" VDEQ also wrote that the "*Department is neither aware of nor in possession of the any documents, studies, or analyses relating the two or discussing the effect of increased opacity on emissions of total PM.*" Yet, VDEQ appears to agree with Mirant's claim that the December 2006 stack test demonstrated a reduction in PM emissions due to the use of trona. On the contrary, the December 2006 stack test is inadequate to make such a claim. First, the comparison of PM emissions with and without trona was only performed for one boiler that showed the smallest increase in opacity, i.e., Boiler 3. No other boiler was tested for this purpose. Second, the stack test reflects a one-time demonstration under controlled circumstances that are not representative of routine emissions. This is evidenced by the fact that Mirant has requested a PM emission limit of 0.055 lb/MMBtu, i.e., a limit that is two to five times higher than the actual stack test results. Additionally, and perhaps most importantly, the stack test results without trona use are based on a dismal performance of the cold-side ESP (CSEP3), i.e., an average PM control efficiency of only 53%. Such low control efficiency represents faulty performance of CSEP3 and resulted in higher PM emissions during the tests when trona was not in use. In contrast, the CSEP3 control efficiencies during the tests with trona ranged from 89% to 94%, which are more representative of the actual capability of CSEP3. Therefore, while the stack test with trona may reflect accurate emissions from Boiler 3, a comparison of these emissions with the results without trona is flawed and cannot be used to claim PM reduction due to trona use. Alexandria requests the Board and VDEQ to remove the reference to dry sorbent injection as a means to control PM emissions in Condition 5 of the proposed SOP.

VI. Health Effects of Trona Must be Studied

VDEQ indicated in its July 26, 2006 letter to Alexandria that a comprehensive evaluation of health effects of trona will be performed. Virginia Department of Health recently completed an inconclusive review and recommended that further studies be conducted. Alexandria requests that trona's health effects be assessed in a comprehensive manner.

Of significant health concern to the residents of Alexandria is the presence silica in trona. The Material Safety Data Sheet ("MSDS") prepared by Solvay Chemicals, Inc., the supplier of trona used by the PRGS, indicates that trona contains up to 2 percent silica. Silica is a carcinogen and the State of California has determined that it is known to cause cancer. Furthermore, repeated exposure to respirable size particles of crystalline silica, the type of silica in trona, can cause adverse health effects such as silicosis, a progressive lung disease.

VII. Alternate Sorbent Must Not be Pre-Authorized

It appears from the VDEQ's latest inspection report on the PRGS facility dated October 4, 2007, that Mirant is pursuing the testing of sodium bicarbonate for SO_2 emission control. While Alexandria is not opposed to such testing, the City strongly believes that Mirant should notify and receive authorization from VDEQ and the Board and that it should submit a detailed testing protocol for approval by VDEQ before the test. Specifically, this protocol should include: (i) characteristics of the tested sodium bicarbonate powder such as particle size analysis, amount required for the tests and associated handling method; (ii) duration of the testing and potential impacts on the environment and public health; (iii) PM_{10} and $PM_{2.5}$ stack tests to establish ESP performance with the use of sodium bicarbonate; and (iv) detailed set up of testing equipment. Alexandria further requests that the testing results be made available to the Board, VDEQ, the City and the public.

If Mirant decides to replace trona with sodium bicarbonate on a permanent basis, a complete and thorough analysis regarding the impact on emissions and the facility's SOP must be completed prior to implementation. Since this replacement would be a change in the method of operation, Mirant must apply for a pre-construction permit prior to its use. For example, the use of sodium bicarbonate may allow PRGS to increase operations while meeting SO_2 emission limits, thereby increasing emissions of other pollutants such as NOx, CO, PM_{10} and $PM_{2.5}$. Without adequate review and a pre-construction permit, the proposed SOP must not be used to pre-authorize the use of any sorbent other than trona.

VIII. Mercury Emission Limits Must be Specified

Condition 37 of the proposed SOP requires PRGS to demonstrate annual compliance with mercury ("Hg") limits. Yet, Conditions 23 through 28 and Condition 30 of the proposed SOP do not specify any Hg limits. Using the most recent 23 months of available data from August 2005 through June 2007, i.e., during the applicable baseline period,

Alexandria performed the following calculation of Hg emissions based on the average actual heat input during this period.

Average Annual Heat Input	= 14,535,332 MMBtu/yr
Hg Emission Factor	= 2.53×10^{-6} lb/MMBtu (Mirant's TRI Report)
Annual Hg Emissions	= 37 lb/yr

Alexandria requests the Board and VDEQ to specify the above Hg emissions as a limit in Condition 30 of the proposed SOP. While the above calculation is based on 23 months of data, and the use of a complete 24-month period would be more appropriate, the 24-month calculation is not likely to be significantly different.

IX. The SOP Must be Practically Enforceable

Virginia regulations require that the SOP must be enforceable as a practical matter. 9 VAC 5-80-850.F. The regulation requires the SOP to specify discrete emission standards (limits) and relevant conditions necessary to enforce these emission standards. To make the emission limits practically enforceable, VDEQ must specify the following as a minimum.

- Limits on production rates and raw material usage, i.e., hourly, daily and annual coal throughput or heat input rate, along with coal specifications. Condition 1 of the proposed SOP specifies the maximum rated capacities that are higher than the PRGS's current SOP dated June 1, 2007. VDEQ must explain the rationale for this increase in heat input rates. Also, while VDEQ states in the SOP that the rated capacities are for informational purposes only and do not form enforceable conditions, these capacities have been used to calculate the proposed emission limits. Therefore, Alexandria requests that the boiler capacities be made enforceable, along with adequate recordkeeping and reporting, to provide a practical way of limiting emissions. Similarly, the limit on the coal sulfur content in Condition 7 has been relaxed from a maximum value of 0.9% in the June 1, 2007 SOP up to a maximum of 1.2% and an average of 1.0% in the proposed SOP, without any rationale for this change. Higher sulfur content will require greater trona use to meet the SO_2 emission limits and will increase particulate matter emissions. Alexandria requests that the coal sulfur content be limited to a maximum value of 0.9%.

- Pollution control operating parameters and the minimum control efficiencies of all pollution controls, e.g., trona injection rate and percent SO_2 control, ESP operating parameters and percent $PM_{10}/PM_{2.5}$ control, LNB/SOFA operating parameters and percent NOx control, and the rate and frequency of water/surfactant application for fugitive dust control.

- Continuous emissions monitoring, e.g., in-stack CEMS for SO_2, NOx, PM and CO.

- Limits must be specified for the number of startups and shutdowns, and emissions during startup and shutdown must be quantified and modeled. This includes emissions generated during "idling" of boilers when no power is being produced. The Board must ensure that any emissions during startup, shutdown and idling are subject to pollution control and abatement requirements at all times, and that sufficient logs are maintained to document the occurrence of these events.

- The proposed SOP lists various boiler combinations as separate operating scenarios along with different SO_2 emission limits for each scenario. Determination of compliance under this scheme, where PRGS can change operating scenarios from day-to-day, or during any given day, is simply cumbersome. Moreover, allowing Mirant to uniquely design SO_2 emission rates for each scenario is a deviation from Virginia's regulation requiring emissions to be minimized to the greatest extent possible by the facility's control technology, in this case the trona injection. 9 VAC 5-40-20.E. Instead, Alexandria recommends that the comprehensive SOP should be streamlined to address worst-case operating conditions that specify the number of units allowed to operate at maximum, minimum and mid-load at any given time. This includes specification of discrete emission limits that are based on optimizing pollution controls and that apply during all hours of operation.

- The initial stack testing requirement for PM_{10} and $PM_{2.5}$ in Condition 33 and the continued stack testing requirement on a limited basis in Condition 37 are inadequate to assure compliance. Alexandria recommends that stack tests for PM_{10} and $PM_{2.5}$ must be required every six months during the first two years. If the semi-annual results show continuous compliance, then the limited testing per Condition 37 can be implemented wherein either 2 or 3 boilers are tested every alternate year.

- The reporting requirements of the proposed SOP must be revised to require Mirant and/or VDEQ to make the PRGS's emissions and operational data available for review by the public without the need for a FOIA request. Alexandria recommends that PRGS's monitoring data, including stack test results, CEMS data, fuel records and ash handling data, be available to the public via Internet access such as a file transfer protocol ("ftp") website.

- Ironically, Condition 19 of the proposed SOP stipulates significantly more stringent compliance assurance monitoring requirements on the silo baghouse than Condition 12 sets for the ESPs. The ESP's readings of secondary voltage and current should be relayed to the PRGS control room continuously. All measurements should be averaged and recorded on a six-minute basis to allow correlation with opacity measurements.

X. VDEQ Must Complete NSR Analysis for the Past Projects

VDEQ indicated in its letter to Alexandria dated July 26, 2006 that it was "*evaluating the applicability of NSR*" to the installation of trona injection and that it would "*complete this*

review and make appropriate recommendations relating to NSR prior to issuance of a draft State Operating Permit." No such analysis has been provided to date. However, given the proposed SOP for PRGS, Alexandria has reason to believe that VDEQ has completed its review of NSR applicability to trona injection, as well as to the installation of low-NOx burners (LNB) and separated overfire air (SOFA) technology, and requests VDEQ to share its findings. Using data available from the PRGS, Alexandria's analysis of these past projects indicates that major NSR was triggered and that PRGS should have applied for a received NSR permits. Under NSR regulations, PRGS must have applied Best Available Control Technology (BACT) and/or Lowest Achievable Emission Rate (LAER), as applicable to the pollutants in question, i.e., CO, PM_{10} and $PM_{2.5}$. For example, based on recent BACT/LAER determinations for coal-fired boilers, stringent emission limits of no more than 0.01 lb/MMBtu for PM and 0.20 lb/MMBtu for CO should be required. In addition, VDEQ's analysis shows that VOC emissions also increased due to these projects and must have been reviewed at the least under Virginia's minor NSR regulations.

Mr. Richard Weeks of VDEQ wrote in a recent communication dated November 5, 2007 to Ms. Elizabeth Chimento, an Alexandria resident, that the NSR review "*was still in process in earlier 2007 but was overtaken by events. Once DEQ was directed by the State Air Pollution Control Board in April of 2007 to public notice a State Operating Permit with an annual limit for sulfur dioxide of 3813 tons, it was apparent that this cap on sulfur dioxide emissions along with the various operational limits imposed by the permit would make the new source review determination on TRONA moot. New source review is conducted to determine whether an activity should result in a permit requirement for new controls or emission limits because the activity is projected to cause a significant emissions increase in criteria pollutants above historic levels. The operational limits and stringent annual limit on emissions of sulfur dioxide imposed by the state operating permit effectively capped emissions from the facility to below historic levels such that no further action on new source review was necessary.*" This is a faulty argument in that the NSR is a pre-construction permitting program and a violation of the NSR regulations requires an enforcement action with commensurate penalties, and not a State Operating Permit. Nonetheless, the issuance of the SOP with an SO_2 limit of 3,813 tons/year on June 1, 2007 did not address any of the pollutants that triggered NSR due to trona installation, i.e., PM_{10}, $PM_{2.5}$ and CO. In fact, the currently proposed SOP allows PRGS to increase its PM_{10} and $PM_{2.5}$ emissions, unlike the stringent limits that would be required in an enforcement proceeding or in a BACT/LAER analysis of a major NSR permit. Therefore, the issuance of the SOP to PRGS does not render the NSR determination moot.

Alexandria requests VDEQ to share its findings of NSR determination on trona installation, as well as on LNB and SOFA installations, and urges the Board to evaluate the proposed SOP limits in light of NSR violations by PRGS. At the least, the SOP limits should be established at levels no greater than the PRGS's actual emissions during the past 24 months, i.e., Fall 2005 through Fall 2007.

XI. Stack Merger Requires a Pre-Construction NSR Permit

Alexandria understands that the proposed SOP does not address the issue of stack merger. However, should Mirant wish to pursue the stack merger project at PRGS, it must first apply for and secure a pre-construction NSR permit. Furthermore, no dispersion credit must be allowed unless Mirant's application is supported by pollution controls to reduce emissions below current levels.

XII. Specific Issues Raised by the Board

Question 1 *Should Continuous Emission Monitoring Systems be required for all Particulate Matter regulated by the Regulations for the Control and Abatement of Air Pollution and (1) does the Environmental Protection Agency (EPA) have an approved methodology for these systems, and (2) has the EPA certified an in stack instrument for this purpose?*

Response PM CEMS should be required on all boilers at PRGS as soon as possible. PM CEMS provide the most reliable data to demonstrate continuous compliance with the emission limits. As discussed previously in this letter, EPA has promulgated the relevant performance specifications and ongoing quality assurance procedures for PM CEMS. Based on these specifications, EPA-certified PM CEMS are currently in use at many facilities across the U.S.

Question 2 *Should the operating performance of the control equipment for sulfur dioxide (SO_2) be the basis for permit limitations rather than the array of operating scenarios?*

Response Virginia regulations require that emissions sources and the associated pollution control equipment must be operated in a manner so as to minimize emissions. 9 VAC 5-40-20.E. The SO_2 emission limits in the SOP must reflect the capability of the trona system to reduce emissions, and these limits must apply at all times under all operating scenarios. Demonstration of compliance under an array of operating scenarios, each with its own emission limit, is cumbersome and not enforceable as a practical matter. Therefore, a single NAAQS-compliant lb/MMBtu emission limit must be specified for all operating scenarios. Should it be necessary for NAAQS compliance purposes to limit plant operations, such as a restriction on the number of boilers or the hours of operation, these limits must be specified in a separate condition independent of the lb/MMBtu emission limits.

Question 3 *Are the varying SO_2 control rates considered intermittent controls?*

Response Virginia regulations define the varying of emission rates according to ambient concentrations as a prohibited dispersion technique.

9 VAC 5-10-20. The proposed SO_2 emission limits in the SOP are based on a comparison of predicted ambient concentrations with the NAAQS, such that a less restrictive emission limit is specified in cases where predicted ambient concentrations are lower. This method of establishing emission limits is an intermittent control because it does not account for the performance capability of the source and the associated pollution control measure, i.e., the trona injection system. Instead, based on the capability of the trona system, a single lb/MMBtu emission limit that is NAAQS compliant and that applies under all operating scenarios must be specified.

Question 4 *Should permit emission rates for SO_2 be established to ensure the use of Trona (or other sorbent materials), and should the proposed minimum sulfur content requirement be eliminated?*

Response The SO_2 emission limits in the SOP must reflect the use of trona up to the capability of this control measure. However, the SOP must not be used to pre-authorize the use of any sorbent other than trona. Instead, because the use of another sorbent would represent a change in the method operation at PRGS, the facility must apply for and secure a pre-construction permit prior to its use. An analysis of NSR applicability must be conducted as a part of the permitting process.

Alexandria does not see the benefit of specifying a minimum sulfur content of coal in the SOP, and believes there is no need for such a requirement. However, Alexandria is concerned that the SOP proposes to relax the limit on maximum sulfur content from the current 0.9% (per the SOP issued on June 1, 2007) up to a maximum of 1.2% and an average of 1.0%. Higher sulfur content will either lead to greater SO_2 emissions or greater use of trona which will increase particulate matter emissions. Therefore, Alexandria requests that the sulfur content of coal should continue to be limited to the current level of 0.9%.

Question 5 *Should the Clean Air Interstate Rule and Clean Air Mercury Rule requirements be included in the permit?*

Response Virginia regulations stipulate that a permit must be reopened for cause if an additional regulatory requirement becomes applicable during the term of the permit or the permit must be revised to assure compliance with an applicable requirement. 9 VAC 5-80-1000. For a federal (Title V) operating permit, Virginia regulations require that a permit must be reopened for cause within 18 months of promulgation of an additional federal requirement if the permit term has at least three years remaining. 9 VAC 5-80-110.L. While the applicable CAIR and CAMR requirements can be addressed by reopening the permit in the future, such a reopening will require an advance notification to the source, and the same procedure

as being followed now for the issuance of the SOP. However, because the CAIR and CAMR have already been promulgated and their requirements are already known, Alexandria does not see any reason to omit these requirements from the SOP. Instead of reopening the permit at a future date for this purpose, Alexandria prefers to include these rules in the SOP as applicable requirements with a future applicable date. Indeed, the facility's Title V operating permit would have to identify these as applicable requirements if that permit were to be issued at this time.

Question 6 *What changes should be made to the architecture of the permit and the emission limits in the proposed permit?*

Response As previously discussed, Alexandria recommends that the SOP should specify a single NAAQS-compliant lb/MMBtu emission limit for each pollutant that reflects the ability of the emission source and the associated pollution control measure, and that applies under all operating scenarios. Operational restrictions such as the number of boilers or the hours of operation, if necessary for NAAQS compliance, must be specified independently of the lb/MMBtu limits. The lb/hour, lb/day and tons/year limits must then be calculated by applying the lb/MMBtu limits to the operational restrictions to establish NAAQS-compliant mass emission limits.

Question 7 *What changes or additions should be made to the proposed parametric monitoring and (1) does such monitoring obviate the need for Particulate Matter Continuous Emissions Monitoring Systems and (2) what is the commercial availability of these instruments?*

Response Parametric monitoring is essential to ensure proper operation of the source and the associated pollution control measures. As described in this comment letter, Alexandria requests that additional parametric monitoring be required to include enforceable boiler heat input rates, coal firing rates, and trona feed rates. Additionally, continuous ESP monitoring in the control room must be required.

The parametric monitoring does not replace the need for continuous emissions monitoring via CEMS. Parametric monitoring is only an indicator of general emissions performance. The actual emissions data can only be verified via CEMS on a continuous basis. Alexandria requests that in addition to the SO2 and NOx CEMS that PRGS currently operates, PM and CO CEMS should be required as soon as possible. The PM CEMS have been certified by U.S. EPA using promulgated procedures and specifications and are commercially available as indicated in this comment letter along with vendor names and facilities currently using it across the U.S.

Once again, Alexandria appreciates the opportunity to provide these comments to the Board and VDEQ on this important matter. Should you have any questions, please do not hesitate to contact William Skrabak at (703) 519-3400, ext. 163.

Sincerely,

Malay Jindal
MACTEC Federal Programs, Inc.

Maureen Barrett, P.E. (Massachusetts)
AERO Engineering Services

William Skrabak
Chief, Division of Environmental Quality
Department of Transportation & Environmental Services
City of Alexandria

cc: The Honorable James P. Moran
The Honorable Tim Kaine
The Honorable L. Preston Bryant, Jr.
The Honorable Richard L. Saslaw, Senate of Virginia
The Honorable Patricia S. Ticer, Senate of Virginia
The Honorable Mary Margaret Whipple, Senate of Virginia
The Honorable Bob Brink, Virginia House of Delegates
The Honorable Adam P. Ebbin, Virginia House of Delegates
The Honorable David L. Englin, Virginia House of Delegates
The Honorable Al Eisenberg, Virginia House of Delegates
The Honorable Brian J. Moran, Virginia House of Delegates
The Honorable Mayor and Members of City Council
Richard Weeks, DEQ
James K. Hartmann, City of Alexandria
Richard Baier, City of Alexandria
Ignacio B. Pessoa, City of Alexandria
John B. Britton, SHSL

State Air Pollution Control Board
&
Department of Environmental Quality

Presentation

By

City of Alexandria

November 19, 2007

Proposed Permit Does not Adequately Address $PM_{2.5}$ Emissions and Impacts

- $PM_{2.5}$ has been a major concern for Alexandrians since downwash was identified in 2004
- Virginia's 9 VAC 5-80-1180.A.3 prohibits the issuance of a permit unless the facility has been "*designed, built and equipped to operate without preventing or interfering with the attainment or maintenance of any ambient air quality standard (AAQS) and without causing or exacerbating a violation of any applicable ambient air quality standard*".
- As part of the state SIP due in April 2008, VDEQ must address any "hot spots" within the $PM_{2.5}$ nonattainment area
- VDEQ's current approach of using PM_{10} as a surrogate for $PM_{2.5}$ is inadequate and irresponsible considering the area's $PM_{2.5}$ nonattainment status

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Proposed $PM_{2.5}$ Limit is not Protective of NAAQS and Public Health

- The federal Clean Air Fine Particle Implementation Rule which became final on April 25, 2007 states that

  "Upon promulgation of this final rule, the EPA will no longer accept the use of PM_{10} emissions information as a surrogate for $PM_{2.5}$ emissions information given that both pollutants are regulated by a National Ambient Air Quality Standard and are therefore considered regulated air pollutants"

- Several states have adopted policies for $PM_{2.5}$ permitting that agree with Alexandria's approach
  - *Ambient air quality modeling for primary $PM_{2.5}$*
  - *Follow EPA guidance proposed in September 2007 using SILs*
  - *Examples: CT, NJ, NY, MI, PA*

- There are several federal guidance documents which describe the acceptability of using AERMOD to estimate a facility's local-scale impacts of primary $PM_{2.5}$

City of Alexandria

3

Proposed $PM_{2.5}$ Limit is not Protective of NAAQS and Public Health

Modeled Primary $PM_{2.5}$ Impacts from PRGS for Boilers Alone (Five-Stack Configuration)

Modeled Scenario	Averaging Period	Modeled $PM_{2.5}$ Rate (lb/MMBtu)	Modeled Impacts on Marina Towers ($\mu g/m^3$)	Monitored Background[3] ($\mu g/m^3$)	Total Impact ($\mu g/m^3$)	24-Hr NAAQS ($\mu g/m^3$)
3 Base Boilers 3, 4 & 5 at min load, 24 hrs/day	24-hr	0.035	21.7 [1]	34.1	55.8	35
2 Base Boilers 4 & 5 at min load, 24 hrs/day	24-hr	0.055	22.1 [2]	34.1	56.2	35
2 Base Boilers 4 & 5 at min load, 24 hrs/day	Annual	0.055	3.5 [2]	14.2	17.7	15

- EPA's proposed SILs: 0.3-1.0 ug/m^3 (annual), 1.2-5.0 ug/m3 (24-hr)

(1), (2) See City of Alexandria letter to SAPCB dated November 17, 2007

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4

Proposed $PM_{2.5}$ Limit is not Protective of NAAQS and Public Health

Calculated $PM_{2.5}$ Emission Limits Necessary for NAAQS Compliance

Averaging Period	Proposed SOP Limit (lb/MMBtu)	Modeled $PM_{2.5}$ Impact at Proposed SOP Limit[1] ($\mu g/m^3$)	U.S. EPA's Proposed $PM_{2.5}$ SILs ($\mu g/m^3$)	Calculated $PM_{2.5}$ Limit for Impacts to be Below SIL (lb/MMBtu)
24-hr	0.055	22.1	5.0	0.012
			4.0	0.010
			1.2	0.003
Annual	0.055	3.5	1.0	0.016
			0.8	0.013
			0.3	0.005

City of Alexandria

5

Baghouses are Required to Adequately Control $PM_{2.5}$ Emissions

- Alexandria's analyses to date show the critical need for baghouses on all five boilers to lower $PM_{2.5}$ emissions to levels that are protective of NAAQS and public health
- Alexandria requests that the Board earnestly consider the benefits of baghouses at PRGS
  - *State-of-the-art technology for $PM_{2.5}$ control on a continuous basis*
  - *Provide multi-pollutant control, e.g., mercury, acid gases, enhanced removal of SO_2 with trona*
- Trona use increases PM emissions and triggers NSR, thus requiring LAER, i.e., baghouses

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6

Trona Does not Reduce PM Emissions

Boiler #3 Stack Testing Results in December 2006 on Filterable PM_{10}

PARAMETER	TRONA OFF		TRONA ON	
	Average	Test Results	Average	Test Results
Hot ESP Removal Efficiency (designed for 99%)	99.01	99.76, 99.55, 97.72	98.99	98.56, 98.93, 99.47
Cold ESP Removal Efficiency (designed for 96%)	71.24	49.83, 73.34, 90.56	88.83	93.21, 90.34, 82.94
Total PM_{10} Removal Efficiency	99.85	99.88, 99.88, 99.78	99.90	99.90, 99.90, 99.91

City of Alexandria

7

Trona Does not Reduce PM Emissions

Mirant opacity data showed increase in opacity with trona injection, and potentially $PM_{2.5}$ emissions (~20,000 data points for each boiler)

Boiler	Average Opacity		% Increase in Opacity, %
	Pre-Trona (Jun-Aug 2005)	Post-Trona (Jun-Aug 2006)	
1	2.86	6.03	110.8
2	4.16	6.76	62.5
3	3.62	3.74	3.3
4	2.61	3.10	18.7
5	2.55	4.10	60.8

Boiler #3 showed the least negative impacts of trona on opacity. However, it was the only boiler used for comparing scenarios with and without trona in 2006 stack testing

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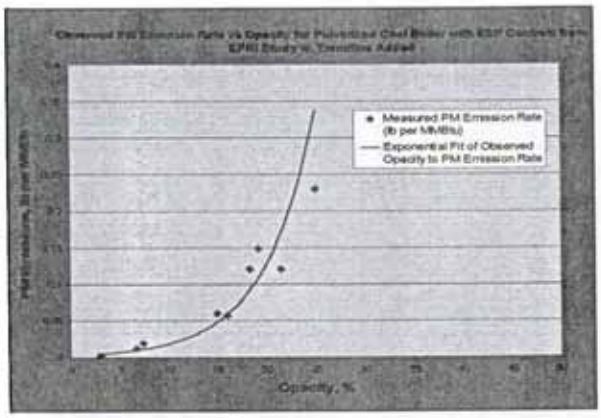
8

Trona Does not Reduce PM Emissions



Quote from VDEQ:

"The Department is neither aware of nor is in possession of any documents, studies, or analyses relating the two or discussing the effect of increased opacity on emissions of total PM"

Fugitive Emissions Impacts Must Be Fully Evaluated to Protect Public Health

- Alexandria's analysis shows significant increase in fugitive emissions since the use of trona which effectively increases the amount of fly ash by >100%
- The permit should include requirement for an enclosed fly ash handling operation and transportation to minimize fugitive emissions impact to local population
  - *Trona contains up to 2% silica, a known carcinogen*

PM & CO CEMS Should Be an Immediate Requirement for this Permit

Partial List of PM CEMS (PS-11 certified) Installed in the US and Used for Monitoring and/or Compliance Purposes

Source	PM CEMS Installation Date	PM CEMS Technology
Tampa Electric – Big Bend Unit 4	Feb 2002	Beta Attenuation
Dominion Generation – Mt. Storm Units 1 & 2	Jul 2004	Beta Attenuation
We Energies - Oak Creek Units 5 & 6	Jan 2005	Beta Attenuation
We Energies - Pleasant Prairie Units 1 & 2	Sep 2006	Beta Attenuation
Western Kentucky Energy - Henderson Unit 2	Aug 2005	Beta Attenuation
Western Kentucky Energy - Henderson Unit 1	Feb 2007	Beta Attenuation
Kentucky Utilities Company - Ghent Station		Light Scatter
Kentucky Utilities Company - Mill Creek Station		Light Scatter
Minnkota Power Coop – M.R. Young Unit 2	Jul 2007	Beta Attenuation
DOE Oak Ridge TSCA Incinerator	Dec 2004	Beta Attenuation
Rayonier Pulp Mill - Recovery Boiler	Apr 2003	Beta Attenuation
Kennecott Utah Copper – Primary Smelter	Dec 2005	Beta Attenuation
Sunoco Refinery – FCCU/CO Boiler Stack	Apr 2007	Beta Attenuation

Pollution Control Measures Must Be Operated to minimize Emissions at All Times

- Virginia regulation 9VAC 5-40-20 E states that

  "[a]t all times, including periods of startup, shutdown, soot blowing and malfunction, owners shall, to the extent practicable, maintain and operate any affected facility including associated air pollution control equipment in a manner consistent with air pollution control practices for minimizing emissions."

- Mirant has proven to be capable of controlling SO_2 emissions to below 0.3 lb/MMBtu on a sustainable basis. The SOP should not permit SO_2 emissions >0.3 lb/MMBtu for any operating scenario

- A single short term emission limit should be imposed

PM and Other Emission Limits are Arbitrary and Unreasonable

- The proposed SOP specifies same PM, PM_{10} and $PM_{2.5}$ emission limit of 0.055 lb/MMBtu for all boilers
- The following are December 2006 stack test results when trona was in use (in lb/MMBtu)

PM	0.018 - 0.029	(<52% of proposed limit)
PM_{10}	0.014 - 0.016	(<29% of proposed limit)
$PM_{2.5}$	0.012 - 0.013	(<23% of proposed limit)

- The plant reported PM emissions of 0.03 lb/MMBtu for 2006

All NSR Issues Must Be Resolved

- All NSR issues must be promptly resolved:
  - Past
    - *Past NSR violations for LNB, SOFA and trona installations*
    - *Increase in the maximum heat input rates as compared to the rated capacities as listed in PRGS's current SOP*
  - Proposed
    - *Use of an alternate sorbent other than trona*
    - *A pre-construction NSR permit must be issued for the stack merger project if Mirant wishes to pursue this project*

Use of Alternate Sorbent Must not Be pre-Authorized

- Testing of alternate sorbent must require a complete protocol
- $PM_{10}/PM_{2.5}$ stack test must be required
  - *With and without sorbent*
  - *Upstream and downstream of ESPs*
  - *Similar to Dec 2006 stack test required by VDEQ for trona*
- Testing must be done on all boilers
- Test results must be analyzed before allowing a new sorbent in the SOP
- Applicability of NSR must be assessed

City of Alexandria

15

Proposed Emission Limits Exceed Baseline

Pollutant	Baseline Emissions (tons/yr)	Proposed SOP Limits (tons/yr)	Proposed Increase (tons/yr)
SO_2	3,813	3,813	0
NOx	1,880	3,700	1,820
PM_{10}	135	377	242
$PM_{2.5}$	116	163	47

- Emissions must be limited to baseline or NSR regulations must be applied

City of Alexandria

16

Summary of Alexandria's Requests

Alexandria respectfully requests that:

- $PM_{2.5}$ emissions from PRGS be modeled and NAAQS-compliant emission limits be established in the permit
- Short term (hourly and daily) emissions are arbitrary and unreasonable. They must be revised to reflect actual operating performance
- Baghouses must be required on all five boilers to protect $PM_{2.5}$ NAAQS and public health

Summary of Alexandria's Requests

- Based on present pollution control performance and/or NAAQS compliance criteria, the limits in the SOP must not exceed the following:

• SO_2	< 0.30 lb/MMBtu	(trona optimization)
• NOx	< 0.22 lb/MMBtu	(LNB/SOFA optimization)
• PM	< 0.03 lb/MMBtu	(ESP performance)
• PM_{10}	< 0.02 lb/MMBtu	(ESP performance)
• $PM_{2.5}$	< 0.003 - 0.011 lb/MMBtu	(NAAQS compliance)
• CO	< 0.20 lb/MMBtu	(BACT)
• Hg	< 37 lb/yr	(actual baseline emissions)
• Coal sulfur	< 0.9 wt%	(current limit for PRGS)

Summary of Alexandria's Requests

- Annual emissions must not exceed baseline emissions during the most recent 24-month period.
- CEMS for CO and PM must be an immediate requirement for all five boilers
- Reference to trona as a PM control must be removed from the SOP

Summary of Alexandria's Requests

- The SOP must not be used to pre-authorize the use of sodium bicarbonate or another alternate sorbent without a complete evaluation and NSR applicability analysis
- Limits and compliance requirements of CAIR and CAMR, which will take effect after the SOP is issued, must be identified in the SOP

Virginians Exposed to PRGS

Virginia Exposure Profile for Children Within 30 Miles of a Coal-Fired Power Plant

Data Sources: U.S. Census Population Estimates for 1997; "Estimated Prevalence and Incidence of Lung Disease by Lung Association Territory," American Lung Association, 2001 (data is for 1998).

Exposure from Plants in State

Plant	State	County	Exposed Population	Children Under 18	Children in Poverty	Pediatric Asthma
Clinch River	VA	Russell	257,092	62,806	17,385	3,231
Glen Lyn	VA	Giles	189,101	37,542	7,652	2,034
Potomac River	VA	Alexandria	1,647,644	346,929	31,787	21,463
Bremo Bluff	VA	Fluvanna	275,546	55,211	9,973	3,330
Chesterfield	VA	Chesterfield	995,523	222,784	40,490	12,973
Chesapeake	VA	Chesapeake	1,423,982	355,198	77,682	20,233
Possum Point	VA	Prince William	1,795,714	382,757	36,846	23,653
Yorktown	VA	York	1,080,626	266,002	64,124	14,746
Clover	VA	Halifax	137,086	31,380	7,399	1,790

EarthTech Health Effect Evaluation

- In response to a concerns raised by SAPCB, City of Alexandria took the initiative to evaluate the health impacts of emissions from the PRGS and their associated costs
- EarthTech was contracted to carry out such evaluation, using EPA's methodologies with focus on
  - *800-meter grid around the PRGS;*
  - *Broader population in a 93-km grid considered in the DOE Special Environmental Evaluation*

How Health Effects/Costs Were Estimated to Evaluate the State Operating Permit

- Similar to methods used by EPA to calculate benefits of air regulations.
- AERMOD (an EPA approved computer program) was used to model emissions of PM from the Potomac River Generating Station
- Modeled air concentrations are input into BenMAP (an EPA computer program) and effect estimates and costs are selected from the programs database.

How Much Do Adverse Health Effects Cost? (800-meter Grid)

Health Effect	Annual Predicted Cases	Direct Costs U.S. 2007$ by Case	1-Year Direct Costs Totals $2007
Premature mortality - all cause	4.10	7,648,032	31,353,106
Chronic bronchitis	3.99	410,043	1,635,498
Nonfatal heart attacks	6.89	42,564	293,163
Respiratory	2.68	65,221	47,535
Cardiovascular	3.88	26,400	20,961
Asthma-related ER visits	3.11	316	984
Acute bronchitis	3.86	72	278
Upper respiratory symptoms	49.01	32	1,555
Lower respiratory symptoms	50.67	19	965
Asthma exacerbations	46.33	89	4,136
Work loss days	1045.25	217	226,324
Minor restricted activity days	5569.83	61	341,573
One-Year, Total Direct Costs, 2007 Dollars			33,952,808

Estimated Total Costs of Health Effects (in 2007 US Dollars)

- Total Estimated Costs for Health Effects over a 30 year period and based on a "worst-case" scenario from the proposed State Operating Permit, for people within 800 meters of the Potomac River Generating Station (PRGS) would be **$665 million**
- Total Estimated Costs for Health Effects over a 30 year period, based on the Department of Energy's Special Environmental Analysis for the PRGS (2006) – Administrative Consent Order Extension Scenario – would be **Over $3 Billion**